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# Northeast Power Coordinating Council 2025 Ontario Interim Review of Resource Adequacy

For the period from 2026 to 2029

October, 2025

Approved by the NPCC RCC on December 1, 2025



# Executive Summary

The Independent Electricity System Operator (IESO) submits this assessment of resource adequacy for the Ontario Area to comply with the Reliability Assessment Program established by the Northeast Power Coordinating Council (NPCC). The 2025 Interim Review of Resource Adequacy covers the study period from 2026 through 2029 and identifies changes in assumptions from the 2024 Comprehensive Review, including generation resources' availability, demand forecast and the impact of these changes on the overall reliability of the Ontario electricity system.

The results presented in the table below conclude that Ontario will be able to meet the NPCC resource adequacy criterion that limits the loss of load expectation (LOLE) to no more than 0.1 days/year for all years within the study period, 2026 to 2029. The NPCC criterion is satisfied with existing and planned resources.

## **Annual Loss of Load Expectation(LOLE), Loss of Load Hours(LOLH) and Expected Unserved Energy(EUE ) Values**

	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>
Forecast Annual Peak Demand (MW)	23,403	24,023	24,544	25,587
Available Resources (MW)	32,540	29,242	31,022	33,041
LOLE (days/year)	0.000	0.060	0.002	0.036
LOLH (hours/year)	0.44	11.17	3.58	22.58
EUE (MWh)	226	8,781	2,458	19,714

The IESO identifies reliability needs through our planning studies, which then determine the set of planned actions to address needs, using the mechanisms in the [Resource Adequacy Framework \(RAF\)](#), and regional and bulk transmission system plans. The increase in supply observed in the 2025 Interim Review is primarily due to assumption of resources operating until end of technical life, while they were previously assumed to be unavailable beyond their contract expiry in the 2024 Comprehensive Review.

The IESO determined Ontario's level of resource adequacy using the General Electric Multi-Area Reliability Simulation (GE-MARS) program. The results of this review show that the IESO will meet the NPCC resource reliability criterion for all the years of the assessment.

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# 1. Introduction

The 2025 Interim Review of Resource Adequacy for Ontario is submitted to the Northeast Power Coordinating Council (NPCC) in accordance with Appendix D of the NPCC Regional Reliability Reference Directory #1, "Design and Operation of the Bulk Power System."

This report was prepared by the Independent Electricity System Operator (IESO) in its capacity as the Planning Coordinator for Ontario.

The 2025 Interim Review of Resource Adequacy covers the study period from 2026 through 2029 and supersedes previous reviews. The last Comprehensive Review was approved by the NPCC Reliability Coordinating Committee in December 2024 and covered the 2025 to 2029 period.

This review is based on the IESO's 2025 Annual Planning Outlook (APO) published in April 2025, with planned actions proposed in the Resource Adequacy Framework (RAF) to meet the identified electricity system needs.

## 2. Changes in the 2025 Interim Review versus the 2024 Comprehensive Review

### 2.1 Demand Forecast

Table 2-1 shows a comparison between the annual peak demand forecasts for the 2025 Interim Review versus the 2024 Comprehensive Review.

**Table 2-1 | Comparison of Demand Forecasts: Normal Weather Annual Peak (MW)**

Year	2025 Interim Review	2024 Comprehensive Review	Difference
2026	23,403	23,860	- 457
2027	24,023	24,264	- 241
2028	24,544	24,659	-115
2029	25,587	25,311	+ 276
Average Annual Growth Rate	3.02 %	1.99 %	+ 1.03

The forecasts included in this 'Reviews of Resource Adequacy for Ontario' reflect the long-term demand forecasts developed for the IESO's APOs that cover an outlook period through year 2050. The 2024 Comprehensive Review reflected the 2024 APO demand forecast developed in the first half of 2023 and published on March 18, 2024 and covers the 26 year period from 2025 to 2050 while the 2025 Interim review reflects the 2025 APO demand forecast developed in the first half of 2024 and published on April 24, 2025 and covers the 25 year period from 2026-2050.

Future demand is affected by many factors that include, but are not limited to, the state of the economy, population, demographics, technology, energy prices, input fuel choices, equipment-purchasing decisions, consumer behaviour, government policy, and long-term commitments to electricity conservation incentive programs. The long-term demand forecast is built on an independent sector level basis, in terms of assumptions and changes in demand, and includes the: 1) residential sector; 2) commercial sector; 3) industrial sector; 4) agricultural sector; 5) transportation electrification; 6) other demand; 7) load modifiers such as electricity conservation incentive programs and regulations such as building codes and equipment standards; and 8) demand measures such as system peak demand shaving programs such as the Industrial Conservation Initiative and demand shifting programs such as the residential space cooling demand response program Peak Perks.

Over the course of the four year period from 2026-2029, the significant drivers in changes in the demand forecast between the 2025 Interim Review and the 2024 Comprehensive Review consist of:

- 1) a significant growth in commercial data centre construction and operation;
- 2) a net increase in industrial sector electricity demand, including:
  - a) marginally higher mineral extraction and processing sub-sector project development and operation;
  - b) several updates in projects in the electric vehicle production and supply chain projects that includes the automobile production and chemical production sub-sectors that consist of:
    - i) new production expected in year 2029 included in the 2025 Interim Review;
    - ii) delays of expected projects included in the 2024 Comprehensive Review; and
    - iii) a handful of cancelled prospective projects included in the 2024 Comprehensive Review;
- 3) a softening of new agricultural sector greenhouse construction and operation;
- 4) marginally higher expected electricity conservation program demand savings; and
- 5) higher expected electricity demand measure program demand savings;

Other demand forecast drivers, such as: 1) residential sector; 2) non-data centre commercial; 3) other manufacturing industrial sub-sectors; 4) transportation electrification; and 5) conservation regulations; are largely consistent between the 2025 Interim Review and 2024 Comprehensive Review demand forecasts.

Although discrete value forecasts are presented, the forecast has an associated level of uncertainty which represents the variability of demand due to weather volatility, as well as uncertainty in the specific scale and timing of the development and implementation of a small number of specific large industrial sector projects that have recently been announced.

## 2.2 Resource Forecast

Table 2-2 compares the capacity of available supply resources at the time of the annual peak for the current 2025 Interim Review with the 2024 Comprehensive Review. These values do not include distributed energy resources (DERs), except for those that participate in the IESO-administered markets.

**Table 2-2 | Comparison of Available Resources Forecasts (MW) at Annual Peak**

<b>Year</b>	<b>2025 Interim Review</b>	<b>2024 Comprehensive Review</b>	<b>Difference</b>
2026	32,540	29,572	2,968
2027	29,242	28,308	934
2028	31,022	30,354	668
2029	33,041	27,945	5,096

The differences in available resources between the 2024 Comprehensive Review and the 2025 Interim Review, for overlapping periods, are primarily driven by changes in how resources are accounted for following contract expiry. The 2024 Comprehensive Review assumed that the existing resources are not available beyond contract expiry. However, in the 2025 Interim Review, these resources are assumed to be available post contract expiry. It is important to differentiate between a resource that comes off-contract and a resource that has (or is expected to) reached end of life or officially decommissioned. A contract expiry does not indicate or imply that a resource would cease operations, and a resource would be required to go through a deregistration process to exit the market. Existing resources in Ontario can be secured via contracts or Capacity Auction commitments, and this is evidenced by the successful results of procurements such as the Medium Term-2 procurements, which is included as part of the 2025 Interim Review.

Available resources are determined based on the following:

1. Total capacity available from thermal units (nuclear, gas, oil and biofuel) after discounting for seasonal derating.
2. Outage schedules, including potential outages over the seasonal peak. The majority of outages that occur over the peak period are due to the refurbishment of nuclear units, whose outages last around three years per unit.
3. Historical median contribution of hydro resources during peak demand hours.
4. Historical median contribution of wind and solar resources during peak demand hours.
5. Effective capacity of projected demand measure resources (Demand Response and Dispatchable Loads).
6. For energy storage resources, the IESO considers a facility's sustained capability over a four-hour energy duration requirement, which is meant to find a balance between system needs, operational flexibility and costs. Currently, a forced outage rate of 50% is used all year round.

## 2.3 Demand Measures

The 2024 Capacity Auction reflected in the 2025 Interim Review was the most competitive yet, where the IESO cleared 2,122 MW, of which 1,124 MW was DR, for the summer 2025 obligation period and 1,524 MW (1,105 MW DR) for the winter 2025/26 obligation period. In June 2023, in response to a Ministerial directive, the IESO launched a residential demand response program known as Peak Perks, targeting residential sector air conditioners. Since the last Comprehensive Review, Peak Perks has grown from up to 90MW to up to 152 MW (in 2026).

## 2.4 Firm Sales and Purchases

The 2024 Capacity Sharing Agreement between the IESO and Hydro-Québec permits for the swap of 600 MW of capacity over a period of up to seven years, starting in winter 2024/2025. Under the agreement, the IESO will provide 600 MW to Hydro-Québec in the winter and Hydro-Québec will provide 600 MW to the IESO in the summer. The IESO may choose to bank any amount of the 600 MW of summer capacity provided in a given year, to be used in a later summer during the agreement (up to the limit of the main intertie with Quebec), allowing capacity to be saved until it is required.

## 2.5 Non-Firm Imports

The IESO has accounted for an expectation that non-firm imports can help meet peak needs in resource adequacy assessments since 2024. The amounts of non-firm imports assumed are updated every year using the most recent four years of data. In this year's update, IESO is using 302 MW of non-firm imports in the summer and 59 MW in the winter.

## 2.6 Emergency Operating Procedures

Emergency operating procedures (EOPs) are used in the resource adequacy assessment. Table 2-3 below summarizes the assumptions regarding the load relief from EOPs used when required in this study. For this study, all EOPs are applied in one block. There are no changes to EOPs compared to the Comprehensive review.

**Table 2-3 | Emergency Operating Procedure Assumptions**

EOP Measure	EOP Impact (% of Demand)
Public Appeals	1.00
No 30-minute OR (473 MW)	0*
No 10-minute OR (945 MW)	0*

Voltage Reductions	1.85
Aggregated Net Impact	2.85

\*Although 30-minute and 10-minute operating reserve (OR) are included in this list of EOPs, the analysis does not impose a requirement to provide for OR since only loss of load events are being considered. Therefore, the net benefit of applying EOPs in the analysis excludes relaxation of OR requirements.

## 2.7 Market Renewal Program

The renewed market was launched on May 1, 2025, improving the way electricity is scheduled and priced across the province. These changes ensure the IESO can continue to make the most cost-effective use of its supply every hour of every day as the grid expands to meet growing demand and incorporate new technologies. The IESO introduced a day-ahead market (DAM) that will provide greater operational certainty to the IESO and greater financial certainty to market participants, which lowers the cost of producing electricity and ensures the IESO commits only the resources required to meet system needs. No reliability impacts are expected over the study horizon as a result of the renewed market.

## 2.8 Environmental Regulations and Fuel Supply

No changes to environmental regulations and fuel supply issues are expected in the 2025 Interim Review as compared to the 2024 Comprehensive Review.

## 2.9 Transfer Capabilities

Transfer capabilities are consistent with those outlined in the IESO's 2025 Annual Planning Outlook's Ontario Transmission Interfaces and Interties Overview. However, compared to the 2024 Comprehensive Review, two notable changes have been made in the 2025 Interim Review:

- MN-ON (Minnesota to Ontario): Decreased from 150 MW in 2024 to 100 MW
- QC-ON (Quebec to Ontario): Decreased from 2,730 MW in 2024 to 2,330 MW

### 3. Resource Adequacy Assessment

The 2025 Interim Review of Resource Adequacy for Ontario is submitted to demonstrate compliance with the resource adequacy requirements of NPCC Regional Reliability Reference Directory #1, "Design and Operation of the Bulk Power System." This report was prepared by the Independent Electricity System Operator (IESO) in its role as the Planning Coordinator for Ontario.

The resource adequacy probabilistic assessment is performed using GE-MARS. The following inputs are used:

- Demand growth forecast and associated load forecast uncertainty (LFU);
- Forecast of available resources and EOPs;
- Planned outage schedules submitted by market participants;
- Equivalent Forced Outage Rate on Demand (EFORd) for thermal units derived using historical generator performance data; and
- Transmission limits of major interfaces connecting different zones.

#### 3.1 Assessment Results

The results presented in the table below show that the NPCC LOLE criterion is satisfied.

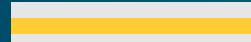
The NPCC criterion is satisfied for all four years with existing and planned resources.

**Table 3-1 | Annual LOLE, LOLH and EUE Values**

	2026	2027	2028	2029
Demand Forecast (MW)	23,403	24,023	24,544	25,587
Available Resources (MW)	32,540	29,242	31,022	33,041
Total Resource Requirement (MW)	30,383	29,077	29,180	32,579
LOLE (days/year)	0.000	0.060	0.002	0.036
LOLH (hours/year)	0.44	11.17	3.58	22.58
EUE (MWh)	226	8,781	2,458	19,714
Normalized EUE (%)	0.00%	0.01%	0.00%	0.01%

## 3.2 Conclusion

The results of this review show that the IESO will meet the NPCC resource reliability criterion (LOLE of 0.1 days/year) for all years of the assessment.

  
**Independent Electricity  
System Operator**

1600-120 Adelaide Street West  
Toronto, Ontario M5H 1T1

Phone: 905.403.6900  
Toll-free: 1.888.448.7777  
E-mail: [customer.relations@ieso.ca](mailto:customer.relations@ieso.ca)

[ieso.ca](http://ieso.ca)

 [@IESO Tweets](https://twitter.com/IESO_Tweets)  
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